

P19004.001

UTILITY  
PATENT APPLICATION  
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.

P19004

Total Pages

Inventor(s) or Application Identifier  
Robert R. BUSHEY, Thomas DEELMAN, and Jennifer M.  
MAUNEYTitle: A METHOD FOR INTEGRATING USER MODELS TO  
INTERFACE DESIGN

ADDRESS TO:

Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

## APPLICATION ELEMENTS

1. ☒ Fee Transmittal Form
2. ☒ Specification [Total Pages 22]  
(preferred arrangement set forth below)  
- Descriptive title of the Invention  
- Cross References to Related Applications  
- Statement Regarding Fed sponsored R & D  
- Reference to Microfiche Appendix  
- Background of the Invention  
- Brief Summary of the Invention  
- Brief Description of the Drawings (if filed)  
- Detailed Description  
- Claim(s)  
- Abstract of the Disclosure
3. ☒ Drawing(s) (35 USC 113) [Total Sheets 2]
4. ☒ Oath or Declaration [Total Pages 3]  
a. ☒ Newly executed (original or copy) ☐ Unexecuted  
b. ☐ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 18 completed)  
[Note Box 5 below]  
i. ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting inventor(s)  
named in the prior application, see 37 CFR 1.63(d)(2)  
and 1.33(b).
- ☐ Incorporation By Reference (useable if Box 4b is checked)  
The entire disclosure of the prior application, from which a copy  
of the oath or declaration is supplied under Box 4b, is considered  
as being part of the disclosure of the accompanying application  
and is hereby incorporated by reference therein.
- ☐ Microfiche Computer Program (Appendix)
7. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)  
a. ☐ Computer Readable Copy  
b. ☐ Paper Copy (identical to computer copy)  
c. ☐ Statement verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

8. ☒ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney  
(when there is an assignee)
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure ☐ Copies of IDS Citations  
Statement (IDS)/PTO-1449
12. ☐ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
14. ☐ Small Entity ☐ Statement filed in prior application,  
Statement(s) Status still proper and desired
15. ☐ The prior application is assigned of record to \_\_\_\_\_
16. ☐ Foreign priority claimed  
a. ☐ Claim of Priority  
b. ☐ Certified Copy of Priority Document(s)
17. ☒ Other: Cover Letter Regarding Executed Application

18. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior Application No. \_\_\_\_\_/\_\_\_\_\_, filed \_\_\_\_\_19. ☐ Amend the specification by inserting before the first line the sentence:

This application is a \_\_ continuation-in-part, \_\_ continuation, \_\_ division, of Application No. \_\_\_\_\_/\_\_\_\_\_, filed \_\_\_\_\_

Address all future correspondence to Customer No. 7055 at the present address of:

GREENBLUM & BERNSTEIN, P.L.C.  
1941 Roland Clarke Place  
Reston, VA 20191  
(703) 716-1191

Date

Signature

Bruce H. Bernstein, Reg No. 29,027

Typed or Printed Name

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Robert R. BUSHEY et al.

Applications Branch

Appln. No. : Not yet assigned

Filed : Concurrently herewith

For : A METHOD FOR INTEGRATING USER MODELS  
TO INTERFACE DESIGN

**COVER LETTER REGARDING EXECUTED APPLICATION**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

The undersigned points out that the executed application being filed herewith includes pages 1 - 3 of the executed declaration which were forwarded to the undersigned, and pages 1 - 22 of the specification (with Figures 1 and 2) which were provided by the law firm of the undersigned. It is noted that the pages submitted by the law firm of the undersigned are identical to those sent to the assignee of the present application. Further, the application was not revised after review.


Accordingly, Applicants respectfully submit that the present application is properly executed and should be considered as filed in executed form. However, if the U.S. Patent and Trademark Office determines that the present application is not properly executed, Applicants respectfully request that the present application be treated as an unexecuted application under 37 C.F.R. 1.53(f).



P19004.A01

Should there be any questions regarding this paper, please contact the undersigned at the below listed number.

Respectfully submitted,  
Robert R. BUSHEY et al.

  
Bruce H. Bernstein  
Reg. No. 29,027

*Reg. No. 33,329*

May 26, 2000  
GREENBLUM & BERNSTEIN, P.L.C.  
1941 Roland Clarke Place  
Reston, Virginia 20191  
(703) 716-1191



TITLE OF INVENTION:

**A METHOD FOR INTEGRATING USER MODELS TO INTERFACE DESIGN**

5

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application claims the benefit of U.S. Provisional Application No. 60/136,406, filed May 27, 1999, the subject matter of which is herein expressly incorporated by reference.

The present invention also relates to a method described in commonly-assigned co-pending U.S. Patent Application No. 09/089,403, "A Method for Categorizing, Describing, and Modeling Types of Systems Users", filed June 3, 1998, to R. Bushey et al., and to a method described in commonly-assigned and co-pending U.S. Patent Application No. 09/303,622, "Methods for Intelligent Routing of Customer Requests Using Customer and Agent Models", filed May 3, 1999, to R. Bushey et al., the subject matter of both of which is expressly incorporated by reference herein.

20

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to the field of user interface design and analysis of human factors which are considered pertinent during the development stages of the user interface. In particular, this invention considers human factors, through behavioral modeling methods, and then incorporates such factors into the iterative design stage of interface development.

### 2. Description of Background Information

The traditional view of user performance during interface design and testing is that variability in responses, preferences, and behavior reflects poor design. The common knowledge and practice in the industry is to represent the user population as having a single set of characteristics and behaviors. In current practice, this single set of characteristics and behaviors focuses on only one of three types: expert, novice, or composite. One group is represented to the exclusion of other groups' needs. This is a particularly inappropriate method of designing in that there is a substantial risk that very few users will be best accommodated by the interface. Subsequently, an interface is designed in such a way that variability would be reduced. As a consequence, the diversity of the user population is neglected and users' unique needs and preferences are effectively ignored.

5 The common knowledge and practice in the industry is twofold. First, it is common practice to take a single view of a user population, and second, to subsequently design system interfaces based on this view. For example, a system interface may be designed to accommodate the behavior of an expert user (e.g., customer service and sales representatives). Alternatively, interfaces can be designed to accommodate a novice user (e.g., interfaces used in automated teller machines for use by the general public). Thus, the current practice represents the user population with a single set of characteristics and behaviors. If users or agents are categorized in any way, they are done so in an informal manner, based primarily on the opinion and judgement of local operating management and not based on formal qualitative and quantitative models, statistical data, or similar objective empirical measures.

10 Since it is common practice to take a singular view of the user population, the interface is designed and tested to reflect average or prototypical end user performance. For instance, during usability testing it is typical to deem a workflow task or design implementation a failure if 5 of 10 users successfully perform the task or function even though the interface was designed superbly for 5 of the users. Similarly, a design implementation is commonly deemed acceptable if 10 of 10 users performed adequately even though a closer examination may reveal that the majority of users reflected outstanding performance while the remaining subset could not display the required behavior. In both of these examples, the variability or diversity in performance is not considered during design or testing. Distinctive behaviors that may be desirable are not

P19004.S01

5 tracked, captured, or accommodated since the emphasis has commonly focused on accommodating average behavior. The testing and design phase of interface development does not capitalize upon, or accommodate, variability in performance primarily because management and systems engineers typically accept the singular view of one user-representation.

10 Capturing the behavioral diversity of the user population is the first of two necessary steps toward the design and deployment of systems and processes that accommodate the specific needs of the user (agent) and facilitate business goals. The second necessary step is systematically integrating the agent models to the design and engineering of user interfaces.

15 Traditionally, the diversity of a user population has not been taken into account during the iterative design stage of interface development. Rather, a system is typically designed with the simplistic view of the "average" or prototypical user in mind. This approach does not accommodate the entire range of behaviors and characteristics of the user population. This single-view may hinder performance of a large proportion of users, given that their specific needs are not accommodated and management and systems interface engineers are unable to capitalize on the unique behavioral qualities that could facilitate performance and achieve business goals.

20 A solution to this approach is to consider the range of behavioral characteristics of the entire user population during the design phase of interface development. This broad range of behavior is ideally captured through use of behavioral models. Once the user



P19004.S01

population is categorized into a reasonable number of groups, the resultant qualitative and quantitative models can be integrated into system design and testing.

Prior art which discloses behavioral models are U.S. Patent Application No. 09/089,403, filed on June 3, 1998, entitled "A Method for Categorizing, Describing, and Modeling Types of Systems Users" and provisional U.S. Patent Application No. 60/097,174, filed on August 20, 1998, entitled "A Method for Intelligent Call Routing Utilizing a Performance Optimizing Calculation Integrating Customer and Agent Behavioral Models".

The Categorize Describe-Model (CDM) methodology, disclosed in U.S. Patent Application No. 09/089,403, is a technique used to categorize a diverse user population into a reasonable number of groups that share similar characteristics. The behaviors of users within these groups are then objectively described and subsequently quantitatively and qualitatively modeled. At any point in this process, the grouping characteristics may be validated and revised based on the data collected and modifications of bottom-line business goals. The end result of the CDM method is that a highly diverse user population is divided into a small number of behaviorally distinctive groups (e.g., 3-5 user-groups). The members of each group share similar characteristics and behaviors. In effect, by using the CDM methodology, the entire range of behavioral diversity of a user population can be captured and accommodated.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a flow diagram of the interface customization selections entered on a user-profile screen, according to an aspect of the present invention.

Figure 2 illustrates a flow diagram of the VaCTAC method of applying user models to interface design, according to an aspect of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

An objective of the disclosed invention is to establish a method that systematically and thoroughly applies user models derived through the CDM method to the design and testing phase of interface development. Rather than assuming a single set of behaviors or characteristics that represents the user population, the CDM method categorizes the user population into a small number of behaviorally distinctive groups. The present invention then extends this process and applies it directly to interface design.

This unique approach to usability testing and systems design ensures that the range of needs and preferences of the entire user population (e.g., each group derived through the CDM method) is considered. Customizing usability testing for each user group and allowing for flexibility in performance, not simply considering "average" behavior, allows for an improved understanding of the users and improved interface design leading to improved performance.

In contrast to the traditional approach, applying the CDM method to interface design involves accommodating variability in performance, and capitalizing on the

diversity within the user population. Application of the CDM method to design and testing involves tracking design requirements and implementations on micro and macro levels, documenting pre-determined user characteristics, capturing new user characteristics that emerge, accommodating diversity in performance and preference during testing, and customizing system display and navigation. This process ultimately facilitates the maintenance of user models to expedite future enhancements and business decisions.

The final objective and end-result is that customer/agent negotiations and call center operations are improved because the negotiation system interface is engineered to accommodate usability needs of the entire user population, targeted behaviors, and preferences that facilitate meeting business objectives.

According to an aspect of the present invention, a method for designing a customized user interface is provided that categorizes a user population into groups using qualitative and quantitative models, and applies the models into interface design, interactive testing, and system deployment. The step of categorizing a user population into groups using qualitative and quantitative models may be based upon Categorize-Describe-Model (CDM) methodology.

According to a further aspect of the present invention a method for designing a customized user interface is provided that includes categorizing at least two users, validating targeted user behaviors and preferences, capturing emergent behaviors and preferences, tracking design requirements and implementations,

accommodating diversity in performance and preference during interactive testing, and customizing a user interface design to each of the at least two users.

Further aspects of the present invention include incorporating the user interface into the following hardware systems: a graphical user interface (GUI) of a sales and billing negotiation system; a telephone system, graphical user interface (GUI) provided on the Internet; a interactive graphic user interface (GUI) system; an automated teller machine; a computer operating system; or a television programming interface.

In another aspect of the present invention, a method for designing a customized user interface is presented that includes categorizing a user population into distinctive groups in which the users' behaviors are described, modeling the categorized user population using Categorize-Describe-Model (CDM) methodology, documenting and validating pre-determined user characteristics as indicated by initially grouping characteristics, including targeted behaviors and preferences, derived through said CDM methodology. The method also includes capturing new user characteristics that emerge, simultaneously tracking design requirements and implementations on both micro and macro levels, accommodating variability and diversity in performance and preference during iterative testing by integrating user-customization into a design by creating a user-profile in which the users select various navigation preferences and information display choices that can be applied throughout the interface, and developing a customized user interface as an end-product.

One embodiment of how a user's interface may be modified based on user-group membership is illustrated in Figure 1. The initial step starts at a user-profile screen or multiple user-profile screens (2). A user profile screen is a segment of the interface where a user may configure or customize the interface to accommodate his/her needs.

Next, the CDM methodology would have pre-determined a user's behavioral characteristics and classified them into a specific user-group. In this example, the user would identify their group membership as the "blue" group (6) or "yellow" group (8). Ultimately, either the user or the system administrator would assign group membership at system log-on or registration.

Once the user identifies his/her group membership, the different functions (preference settings) within the interface are changed to accommodate the user-group's needs (10, 12). In this example, the user may also change his/her preference settings individually as well. Some examples of preference settings are: (1) short-cut keys - keys or macros that accelerate different functions; (2) pre-pop of account information - certain information that may be automatically presented on a screen at the users' discretion, such as account information; or (3) workflow maps - maps and help aids that indicate to the user what they should do during a negotiation. As an end result, the system interface would reflect functionality that is customized to the user's group membership (10, 12).

Figure 2 illustrates a preferred embodiment of how the CDM method is ideally applied to design and testing phases of interface development. As a preliminary step

toward applying user models to design, the user population must be categorized into distinctive groups, their behaviors described, and subsequently modeled (14).

Once the CDM methodology is complete (14), the interface design process is implemented (16). The next series of boxes (shown in a clockwise arrangement; 16) depicts the application of the CDM method to interface design. Application of the CDM method to design and testing involves, first documenting and Validating pre-determined user characteristics as indicated by the initial grouping characteristics derived through the CDM method (18). This would include targeted behaviors and preferences, and is a static process.

Second, Capturing new user characteristics that emerge is essential, given that new behaviors and characteristics are imminent with a new or enhanced system and must be quantified to enhance the initial grouping characteristics (20).

Third, design requirements and implementations must be Tracked (22) on both micro (within individual screens) and macro levels (how design alternatives fit within the user's work-flow). Tracking design implementations on micro levels refers to the detailed consideration of individual components of the interface (e.g., the placement and functionality of certain buttons on an individual graphical user interface (GUI) screen). Tracking design implementations on macro levels refers to the consideration of how all the interface components, being collectively the entire interface design, matches with the goals and the tasks of the user.

Fourth, Accommodating variability and diversity in performance and preference during iterative testing is paramount to taking the unique needs of the user population into consideration when developing final design requirements (24).

Finally, an extension of the process of accommodating variability and diversity is to integrate appropriate user-Customization in to the design (26). This would be accomplished through creating a user-profile in which the user would select various navigation preferences and information display choices that would be applied throughout the interface. Such alternatives and choices are determined based on behavioral characteristics of the user groups (derived via CDM phase) and business decisions from operations/management personnel.

The entire process of applying user models to interface design is referred to as the VaCTAC method (Validate, Capture, Track, Accommodate and Customize). The end-product of this technique is a new interface (28) that: (a) has enhanced usability, (b) facilitates behaviors and preferences that are consistent to meeting business goals and operational decisions, (c) the broad range of usability needs of the entire population are addressed and capitalized upon by operations management, (d) results in revised, enhanced, and validated quantitative and qualitative user models, and (e) the design of future releases and enhancements would be expedited by the thorough knowledge of the user population gathered by this process.

To better understand the invention, it is important to describe in further detail how the CDM methodology may be applied to interface design. The first portion of data that

contributes to this process is the "screenflow" analysis of the present invention. This analysis also helps to add detail to the qualitative user models and provides the level of detail necessary to create quantitative models of service representative behavior. The approach taken is to analyze specific call types based on the customer's initial request and how this request is ultimately resolved. These specific call types can then be analyzed to determine the prototypical navigation behavior used for that particular type of call.

A primary aspect of determining prototypical navigation behavior is to indicate the most common number, type, and sequence of interface screens visited during the particular customer/representative negotiation. A detailed description of this process and the results are provided below. The data used for this analysis was captured during side-by-side observations of service representatives.

In order to determine a prototypical screen-flow, it is necessary to identify call-types that are essentially identical to one another. For instance, all calls in which the customer requests "caller ID" to be added to their service, would be considered virtually identical to one another since the task of the service representative should be the same in all cases. To this end, the majority of calls observed were from two categories, namely, "order" and "information (info)" types of calls. The data captured that was used in identifying exactly what kind of calls fell within order and information given from the customer's opening statement (e.g., "I want to get a second telephone line for my computer modem") which was compared to the final resolution of the call (order, transfer, etc). It was determined that "information" types of calls included a wide variety of



P19004.S01

customer requests, so many in fact, that there was no single type of request that occurred frequently enough to warrant or allow subsequent analysis. However, there was sufficient consistency of customer requests under "order" call types to allow further analysis.

Therefore, all order type calls collected at call centers were categorized into sub-  
groups. A total of nine order call types were found, based on customers' opening  
statements and the observers' label of how the call was ultimately resolved. Four of the  
nine call types were subsequently analyzed, namely: new connects, moves, disconnect  
line, and caller ID. The problem and disconnect call types were not analyzed because  
further inspections of the screen flows indicated that these call types involved a wide  
range of navigation behavior that varied on a call-to-call basis. Therefore, a prototypical  
screen flow could not be determined for these call types. Additional line (ADL), call  
blocker, and name change types were not included in subsequent analyses because there  
was not a sufficient number of these call from which to base meaningful conclusions.  
Although the number of caller ID calls was similarly low, it included the highest number  
of calls that a customer requested a specific product or service, and was subsequently  
included to minimally represent this type of customer/service representative negotiation.

For each call, it is necessary to determine the prototypical screen flow (baseline).  
In other words, it is necessary to identify the primary screens that service representatives  
visit and in what order these screens are visited. A baseline can be determined by  
visually inspecting a sample of individual records of screen flows for a given call type.  
For example, about 10-12 records can be inspected to determine a baseline screen flow.

P19004.S01

This visual inspection should be conducted to identify patterns of the same screens that are visited in the same sequence. The result is an initial baseline screen flow from which all records of the particular call type may be compared. In this way, it is possible to assess the common screen flow pattern associated with a given call type. Many of the representatives also visited other screens during negotiations, but these screens were not visited with any regularity among representatives. These “tangents” that a given representative would make during a negotiation within the screen flow were also analyzed, but results did not show any distinctive patterns. Each record of screen navigation also included behavioral data such as the sequential occurrence of cross-selling attempts and sequential occurrence of when a representative used a “help aid” (help aids include: a calculator, help screens, assistance from a manager, etc.).

The methodology of applying CDM to interface design would proceed in the following manner: during the requirements gathering phase of the interface design, documents are generated that captured roadblocks to usability within the present system and alternative design ideas to address these roadblocks. These “paste-ins” provide the starting point to implement CDM to design. Specifically, each design idea and/or requirement should be rated in terms of accommodating the quantitative models of the user population. Each design idea and/or requirement would consist of a description of functionality and checked whether or not it accommodates a given CDM user population grouping (blue, yellow, etc). This may be expanded to include a description of how a given group’s characteristics have been accommodated, or how a given group’s

characteristics have not been addressed to serve as a future aid to subsequent design enhancements. This could take the form of simply YES/NO binary coding, or as ratings based on subjective opinions of the designer(s) of the "level of accommodation". (1 - not accommodated; 7 - group's characteristics fully addressed). In addition, ratings should be made with reference to how an individual "fits" in with design requirement (micro implement) "fits"-in with the over-all workflow, and /or across screen navigation.

10 009250" 1064560  
15 The advantages and benefits provided to the user of the present invention are numerous. Revenue generated per customer call should increase, since the sales/negotiation system is more customized to the individual user, reducing mental workload on the user and thus allowing for more emphasis on sales rather than navigation/system manipulation. Opposing behaviors are accounted for, which would increase the operational efficiency of the call center. For instance, the interface supports speed oriented behavior (high volume, short duration/low revenue calls) while simultaneously supporting service-oriented behavior (low volume, long duration/high revenue calls).

20 Also, a more customized system will maximize user-efficiency and thereby decrease unnecessary time-on-the-line and increase customer accessibility. Agents using this method could out-perform other similar agents at other organizations. Other organizations would still be attempting to meet the needs and preferences of their systems-users without a systematic method of accomplishing these requirements. Thus,

the method of the present invention also represents an opportunity to distinguish the user of this method from all other carriers.

The user of this invention can benefit from strengthening its image with agents. It gives agents a reason to enhance their opinion of the user of the method of the present invention as a company that does adjust to employee's needs and capabilities. Thus, it is possible the user of this method may become the carrier of choice for the next generation and top performing agents. Finally, the method of the present invention allows agents to be compatible with Wireless, Long Distance, and other future services. The methodology of accommodating the range of behavioral diversity of systems users can be transferred and applied to different sales negotiation systems and interface development teams.

Although the invention has been described with reference to several exemplary embodiments, it is understood that the words that have been used are words of description and illustration, rather than words of limitation. The method disclosed can be used to design interfaces for a variety of systems, including but not limited to interactive telephone systems, interactive voice response systems, Internet based systems, interactive graphic user interface systems, automated teller machines, computer systems, television programming interfaces, and any other system which has an user interface.

Changes may be made, without departing from the scope and spirit of the invention in its aspects. Although the invention has been described herein with reference to particular hardware, software, means, and embodiments, the invention is not intended to be limited to the particulars disclosed herein; rather, the invention extends to all

P19004.S01

functionally equivalent structures, methods and uses, such as are within the scope of the  
appended claims.

5

10  
15  
20  
25  
30  
35  
40  
45  
50  
55  
60  
65  
70  
75  
80  
85  
90  
95  
100  
105  
110  
115  
120  
125  
130  
135  
140  
145  
150  
155  
160  
165  
170  
175  
180  
185  
190  
195  
200  
205  
210  
215  
220  
225  
230  
235  
240  
245  
250  
255  
260  
265  
270  
275  
280  
285  
290  
295  
300  
305  
310  
315  
320  
325  
330  
335  
340  
345  
350  
355  
360  
365  
370  
375  
380  
385  
390  
395  
400  
405  
410  
415  
420  
425  
430  
435  
440  
445  
450  
455  
460  
465  
470  
475  
480  
485  
490  
495  
500  
505  
510  
515  
520  
525  
530  
535  
540  
545  
550  
555  
560  
565  
570  
575  
580  
585  
590  
595  
600  
605  
610  
615  
620  
625  
630  
635  
640  
645  
650  
655  
660  
665  
670  
675  
680  
685  
690  
695  
700  
705  
710  
715  
720  
725  
730  
735  
740  
745  
750  
755  
760  
765  
770  
775  
780  
785  
790  
795  
800  
805  
810  
815  
820  
825  
830  
835  
840  
845  
850  
855  
860  
865  
870  
875  
880  
885  
890  
895  
900  
905  
910  
915  
920  
925  
930  
935  
940  
945  
950  
955  
960  
965  
970  
975  
980  
985  
990  
995  
1000

20

WHAT IS CLAIMED:

1. A method for designing a customized user interface comprising:  
categorizing a user population into groups using qualitative and quantitative  
models; and  
applying said models into interface design, interactive testing, and system  
deployment.
2. The method according to claim 1, wherein the step of categorizing a user  
population into groups using qualitative and quantitative models is based upon  
Categorize-Describe-Model (CDM) methodology.
3. A method for designing a customized user interface comprising:  
categorizing at least two users;  
validating targeted user behaviors and preferences;  
capturing emergent behaviors and preferences;  
tracking design requirements and implementations;  
accommodating diversity in performance and preference during interactive  
testing; and  
customizing a user interface design to each of the at least two users.

P19004.S01

4. The method according to claim 3, further comprising incorporating said user interface into a graphical user interface (GUI) of a sales and billing negotiation system.
5. The method according to claim 3, further comprising incorporating said user interface into a telephone system.
6. The method according to claim 3, further comprising incorporating said user interface based a on graphical user interface (GUI) provided on the Internet.
7. The method according to claim 3, further comprising incorporating said user interface into an interactive graphic user interface (GUI) system.
8. The method according to claim 3, further comprising incorporating said user interface into an automated teller machine.
9. The method according to claim 3, further comprising incorporating said user interface into a computer operating system.
10. The method according to claim 3, further comprising incorporating said user interface into a television programming interface.

11. A method for designing a customized user interface comprising:  
categorizing a user population into distinctive groups in which said users'  
behaviors are described;  
modeling said categorized user population using Categorize-Describe-  
Model (CDM) methodology;  
documenting and validating pre-determined user characteristics as indicated by  
initially grouping characteristics, including targeted behaviors and preferences, derived  
through said CDM methodology;  
capturing new user characteristics that emerge;  
simultaneously tracking design requirements and implementations on both micro  
and macro levels;  
accommodating variability and diversity in performance and preference during  
iterative testing by integrating user-customization into a design by creating a user-profile  
in which the users select various navigation preferences and information display choices  
that can be applied throughout the interface; and  
wherein a customized user interface is developed as an end-product.

12. The method according to claim 11, further comprising incorporating said user  
interface into a graphical user interface (GUI) of a sales and billing negotiation system.



P19004.S01

13. The method according to claim 11, further comprising incorporating said user interface into a telephone system.

14. The method according to claim 11, further comprising incorporating said user interface based a on graphical user interface (GUI) provided on the Internet.

15. The method according to claim 11, further comprising incorporating said user interface into an interactive graphic user interface (GUI) system.

16. The method according to claim 11, further comprising incorporating said user interface into an automated teller machine.

17. The method according to claim 11, further comprising incorporating said user interface into a computer operating system.

18. The method according to claim 11, further comprising incorporating said user interface into a television programming interface.

## 5

10

009250-40684560

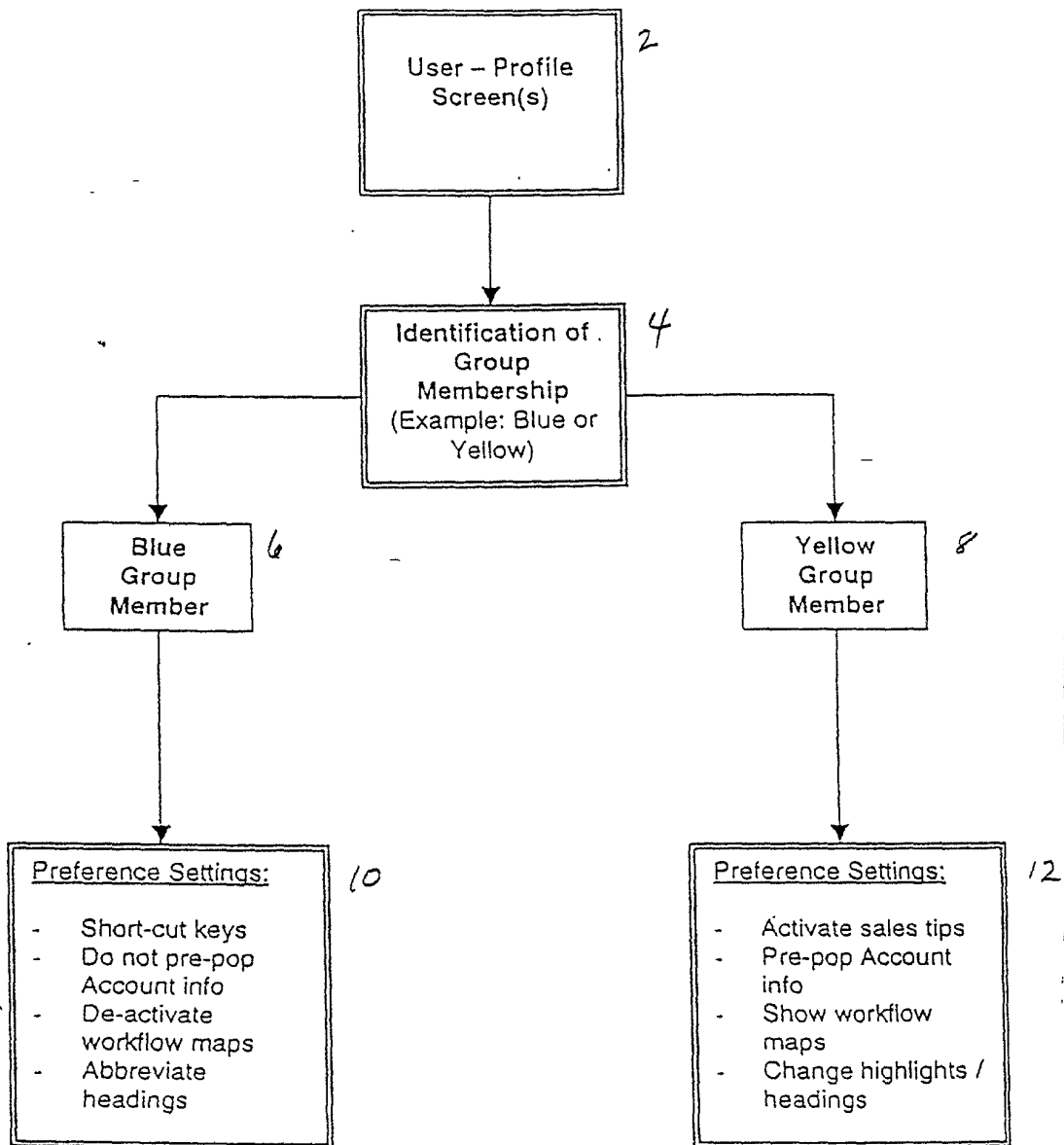


FIGURE 1

```
graph TD; 14[14 Categorize Agent Population Using CDM Method] --> 16{16 "Application of CDM to Iterative design and Testing of Interface"  
Is interface designed and tested to sufficiently meet requirements?  
YES  
NO}; 16 -- YES --> 28[28 New Interface:  
- Enhanced Usability  
- Business Goals Met  
- Entire Population Considered  
- User Models Validated  
- Design of Future Versions Expedited]; 16 -- NO --> 18[18 Validate Targeted Behaviors & Preferences (Static)]; 18 --> 20[20 Capture Emergent Behaviors & Preferences (Dynamic)]; 20 --> 22[22 Track Design Implementations (Micro & Macro)]; 22 --> 24[24 Accommodate Variability & Diversity During Usability Testing]; 24 --> 26[26 Customize Design and Integrate Flexibility into Screens & Workflow]; 26 --> 16;
```

The flowchart illustrates the CDM method for iterative design and testing of interface. It begins with step 14, "Categorize Agent Population Using CDM Method," which leads to step 16, "Application of CDM to Iterative design and Testing of Interface." Step 16 is a decision point: "Is interface designed and tested to sufficiently meet requirements?" If YES, it leads to step 28, "New Interface," which lists: Enhanced Usability, Business Goals Met, Entire Population Considered, User Models Validated, and Design of Future Versions Expedited. If NO, it leads to step 18, "Validate Targeted Behaviors & Preferences (Static)," which then leads to step 20, "Capture Emergent Behaviors & Preferences (Dynamic)." Step 20 leads to step 22, "Track Design Implementations (Micro & Macro)," which leads to step 24, "Accommodate Variability & Diversity During Usability Testing." Step 24 leads to step 26, "Customize Design and Integrate Flexibility into Screens & Workflow," which then loops back to step 16.

FIGURE 2

# Declaration and Power of Attorney For Utility or Design Patent Application

## English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

A METHOD FOR INTEGRATING USER MODELS TO INTERFACE DESIGN  
the specification of which is attached hereto unless the following box is checked:

☐ was filed on \_\_\_\_\_ as

United States Application Number \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable) or,

PCT International Application Number \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119 (a-d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below. I have also identified below, by checking the "No" box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

			Priority Claimed	
			<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

☐ Additional foreign application numbers are listed on a supplemental priority sheet attached hereto.

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

<u>60/136,406</u>	<u>27 May 1999</u>
(Number)	(Day/Month/Year Filed)
_____	_____
(Number)	(Day/Month/Year Filed)
_____	_____
(Number)	(Day/Month/Year Filed)

☐ Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s), or §365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

(Application No.)

(Filing Date)

(Status)  
(patented, pending, abandoned)

(Application No.)

(Filing Date)

(Status)  
(patented, pending, abandoned)

☐ Additional U.S. or international application numbers are listed on a supplemental priority sheet attached hereto.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from either his foreign patent agent or corporate representative, if any, as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the attorney(s) and/or agent(s) associated with the Customer Number provided below to prosecute this application and transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number:

**CUSTOMER NUMBER 7055**

The appointed attorneys include:

Neil F. Greenblum	Reg. No. 28,394	Stephen M. Roylance	Reg. No. 31,296
Bruce H. Bernstein	Reg. No. 29,027	Leslie J. Paperner	Reg. No. 33,329
Arnold Turk	Reg. No. 33,094	William Pieprz	Reg. No. 33,630
James L. Rowland	Reg. No. 32,674	William E. Lyddane	Reg. No. 41,568
Bruce E. Stuckman	Reg. No. 36,693		

At: Greenblum & Bernstein, P.L.C.  
1941 Roland Clarke Place  
Reston, VA 20191

Direct Telephone Calls to: Greenblum & Bernstein, P.L.C. (703) 716-1191

Full name of sole or first inventor

Robert R. BUSHEY

Inventor's signature

Robert R. Bushey

Date

5-25-00

Residence

Cedar Park, Texas


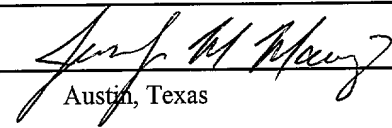
Citizenship

United States of America

Post Office Address

2710 Melba Pass  
Cedar Park, Texas 78613

(Supply similar information and signature for second and subsequent joint inventors.)

Full name of second joint inventor, if any	Thomas Deelman
Second Inventor's signature	 Date 5-25-00
Residence	Cedar Park, Texas
Citizenship	United States of America
Post Office Address	1706 Ascot Lane Cedar Park, Texas 78613
Full name of third joint inventor, if any	Jennifer M. MAUNEY
Third Inventor's signature	 Date 5/25/2000
Residence	Austin, Texas
Citizenship	United States of America
Post Office Address	6506 Harrogate Drive Austin, Texas 78759
Full name of fourth joint inventor, if any	
Fourth Inventor's signature	Date
Residence	
Citizenship	
Post Office Address	
Full name of fifth joint inventor, if any	
Fifth Inventor's signature	Date
Residence	
Citizenship	
Post Office Address	
Full name of sixth joint inventor, if any	
Sixth Inventor's signature	Date
Residence	
Citizenship	
Post Office Address	